

## Claims

- [c1] 1. A circuit for providing an assistant current to a main output stage having a main current, comprising:
  - a monitoring stage for receiving a signal from a main output stage and outputting a decayed push signal and a decayed pull signal; and
  - an assistant output stage for receiving the decayed push signal and the decayed pull signal to output an assistant current.
- [c2] 2. The circuit of claim 1, wherein the assistant current further feeds back to the main output stage.
- [c3] 3. The circuit of claim 1, wherein the assistant current is turned on automatically after the main current is turned on.
- [c4] 4. The circuit of claim 1, wherein the assistant current is turned off automatically before the main current is turned off.
- [c5] 5. A method for providing a push current and a pull current to a system having a main current, comprising:
  - detecting a first input and a second input;
  - generating a push current when a voltage of the second

input is larger than a voltage of the first input and is enough to turn on at least one of the switches; and generating a pull current when a voltage of the first input is larger than a voltage of the second input and is enough to turn on at least one of the switches.

- [c6] 6. The method of claim 5, wherein the push current and the pull current further feed back to one of the first input and the second input.
- [c7] 7. The method of claim 5, wherein the push current and the pull current is turned on automatically after the main current is turned on.
- [c8] 8. The method of claim 5, wherein the push current and the pull current is turned off automatically before the main current is turned off.